

In the Drawings

Please replace the drawing sheet containing Figures 6c and 7a and the drawing sheet containing Figures 7b and 7c with the enclosed replacement sheets.

REMARKS

In the patent application, claims 1-35 are pending. Claims 24-35 have been withdrawn from consideration. Claims 1-23 are rejected.

Applicant has amended claims 1, 3, 4, 5, 6, 9 and 11 and canceled claim 10. Claim 1 has been amended to include the limitation that the fuel cell is operatively connected to a fuel replenishing unit via a connecting conduit and the limitation that the extracted heat is used for heating part of the liquid fuel component so as to enhance the activation efficiency in the fuel activation unit. The support for the amendment can be found on p.6, line 21 to p.7, line 6 of the specification.

Claim 3 has been amended for formal matters. Claims 4 and 5 have been amended such that the heat from the electronic component is channeled away at least to the connecting fuel conduit. The support for the amendment can be found on p.7, lines 1-5.

Claims 6, 9 and 11 have been amended to clarify that the fuel component is a liquid fuel component which is a mixture of alcohol and water.

No new matter has been introduced.

At section 2 of the office action, the drawings are objected to because the reference numeral 200 in Figure 6c has been erroneously labeled as 220. Applicant has submitted a replacement sheet to correct for the error. Applicant has also submitted a replacement sheet to correct for same error in Figures 7b and 7c.

No new matter has been introduced.

At section 3, the specification is objected to because of the informalities. Applicant has amended the specification as suggested.

At section 5, claims 1-5, 10-15, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by *Uchida et al.* (U.S. Patent No. 6,057,051, hereafter referred to as *Uchida*).

In rejecting these claims, the Examiner states that *Uchida* discloses a method and system as claimed. In particular, the Examiner points to *Uchida* for disclosing a water retention unit 8, which is held in contact with the fuel cell body 4 to absorb heat produced when the fuel cell body

generates electricity. The water retention unit 8 is also be held in contact with the hydrogen storage unit 5 to heat the hydrogen storing alloy in order to enhance the efficiency of the hydrogen-discharging reaction (col. 6, lines 49-58).

The Examiner also states that *Uchida* discloses a fuel conduit operatively connecting the replenishing unit and the cell compartment and part of the fuel component is heated through the fuel conduit as the fuel component is conveyed to the cell compartment in the fuel cell (item 6b in Figures 7 and 10; col.6, lines 13-23 and 49-59).

It is respectfully submitted that *Uchida* discloses a hydrogen fuel cell wherein a hydrogen storage unit is used to provide hydrogen gas to the fuel cell body and an air feed device is used to supply oxygen to the fuel cell body for the generation of electricity (see Abstract). A plurality of hydrogen supply pipes 6b are used to feed the hydrogen from the hydrogen storage unit 5 to the fuel cell body 4 (col.6, lines 13 – 23). The hydrogen supply pipes 6b are embedded in the water retention means 8 (col.6, lines 29-30). The hydrogen supply pipes 6b are made of a material which allows water, but not gas, to permeate through. As such, water in the water retention means 8 can penetrate into the hydrogen supply pipes 6b to humidify the hydrogen gas fed to fuel cell body (col.6, lines 44 – 49). Although the water retention means 8 is used to absorb heat and used as a heat exchanger, it is used to absorb heat produced by the fuel cell body when the fuel cell generates electricity (col.6, lines 49-58). The heat is used to heat the hydrogen storing alloy in order to enhance the efficiency of discharging the stored hydrogen gas from the hydrogen storing alloy.

The claimed invention uses a fuel activation unit in a fuel cell to activate a liquid fuel component in order to generate electricity. The liquid fuel component is stored in a fuel replenishing unit. A fuel conduit connected between the fuel replenishing unit and the fuel cell is used to replenish the liquid fuel component in the fuel cell. Heat generated in the PC is used to heat the liquid fuel component while it is passing through the fuel conduit so that the heated liquid fuel component can be more efficiently activated in the fuel cell.

Uchida only discloses heating the fuel replenishing unit (the hydrogen storing alloy) to enhance of efficiency of discharging the hydrogen gas stored in the hydrogen storing alloy. *Uchida* does not disclose heating the fuel component in the connecting conduit and causing the heated fuel component to engage in the fuel activation unit for activation so as to enhance

efficiency of the activation in the fuel activation unit. In fact, *Uchida* uses a water retention unit 8 to channel away the heat produced by the fuel cell body (col.6, lines 49-58).

For the above reasons, claim 1 is clearly distinguishable over the cited *Uchida* reference.

As for claims 2-5, 11-15, 19, 21 and 22, they are dependent from claim 1 and recite features not recited in claim 1. For reasons regarding claim 1 above, it is respectfully submitted that claims 2-5, 11-15, 19, 21 and 22 are also distinguishable over the cited *Uchida* reference.

At section 7, claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Uchida*, in view of *Gamo et al.* (U.S. Patent No. 5,976,725, hereafter referred to as *Gamo*). The Examiner cites *Gamo* for disclosing a fuel component comprising methanol or hydrogen occluding alloy (col.1, lines 26-31; col.9, lines 8-43).

It is respectfully submitted that, at col.1, lines 26-31, *Gamo* discloses that, as a fuel, methanol, natural gas or hydrogen is mainly used. However, for a small-sized power supply, hydrogen gas stored in a hydrogen occlusion alloy is used. At col. 9, lines 8-43, *Gamo* discloses that heated generated by the fuel cell is channeled away by a heating plate or heat pipe so that the heat can be used to heat the hydrogen occlusion alloy in order to enhance the release of hydrogen gas from the alloy. However, *Gamo* does not disclose or suggest heating the liquid fuel component in the connecting conduit in order to enhance the activation of liquid fuel component in the fuel activation unit in the fuel cell. Like *Uchida*, *Gamo* is irrelevant to the claimed invention.

Furthermore, claims 6-9 are dependent from claim 1 and recite features not recited in claim 1. For reasons regarding claim 1 above, claims 6-9 are also distinguishable over the cited *Uchida* and *Gamo* references.

At section 8, claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Uchida* as applied to claims 1 and 3.

It is respectfully submitted that claims 16-18 are dependent from claim 1 and recite features not recited in claim 1. For reasons regarding claim 1 above, claims 16-18 are also distinguishable over the cited *Uchida* reference.

At section 9, claims 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Uchida*, in view of *Streckert et al.* (U.S. Patent No. 6,447,945 B1, hereafter referred to as *Streckert*). The Examiner cites *Streckert* for disclosing removing part of the byproduct water and heating the fuel part to a temperature to a range of 50° C to 85° C, col. 6, lines 1 – 3).

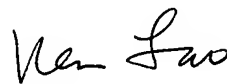
It is respectfully submitted that, at col. 5, line 63 to col. 6, line 3, *Streckert* discloses that a blower 23 that is used to supply oxygen to the fuel cells can also be used to carry away heat from the fuel cells so that the fuel cells are maintained with a desired operating temperature. *Streckert* discloses a hydrogen/oxygen fuel cell. *Streckert* does not disclose heating the liquid fuel component in a fuel conduit. Like *Uchida* and *Gamo*, *Streckert* is irrelevant to the claimed invention.

Furthermore, claims 20 and 23 are dependent from claim 1 and recite features not recited in claim 1. For reasons regarding claim 1 above, claims 20 and 23 are also distinguishable over the cited *Uchida* and *Streckert* references.

CONCLUSION

As amended, claims 1-9 and 11-23 are allowable. Early allowance of claims 1-9 and 11-23 is earnestly solicited.

Respectfully submitted,



Kenneth Q. Lao
Registration No. 40,061

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WARE, FRESSOLA, VAN DER SLUYS
& ADOLPHSON LLP
Bradford Green, Building 5
755 Main Street, PO Box 224
Monroe, CT 06468
(203) 261-1234
Customer No. 004955

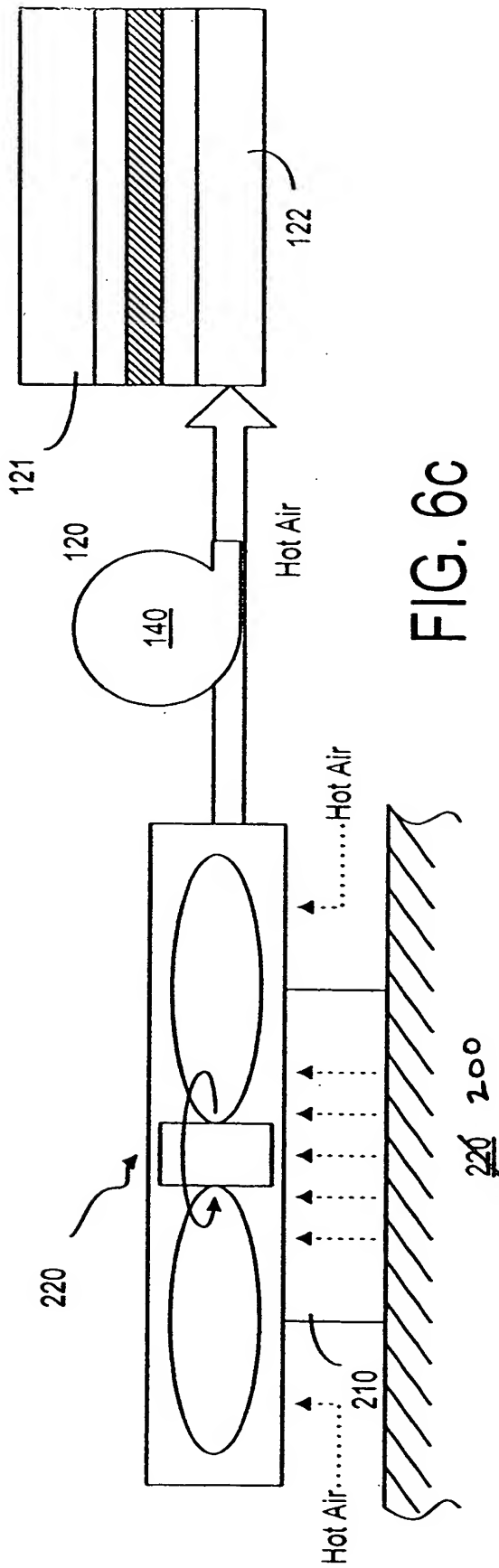


FIG. 6C

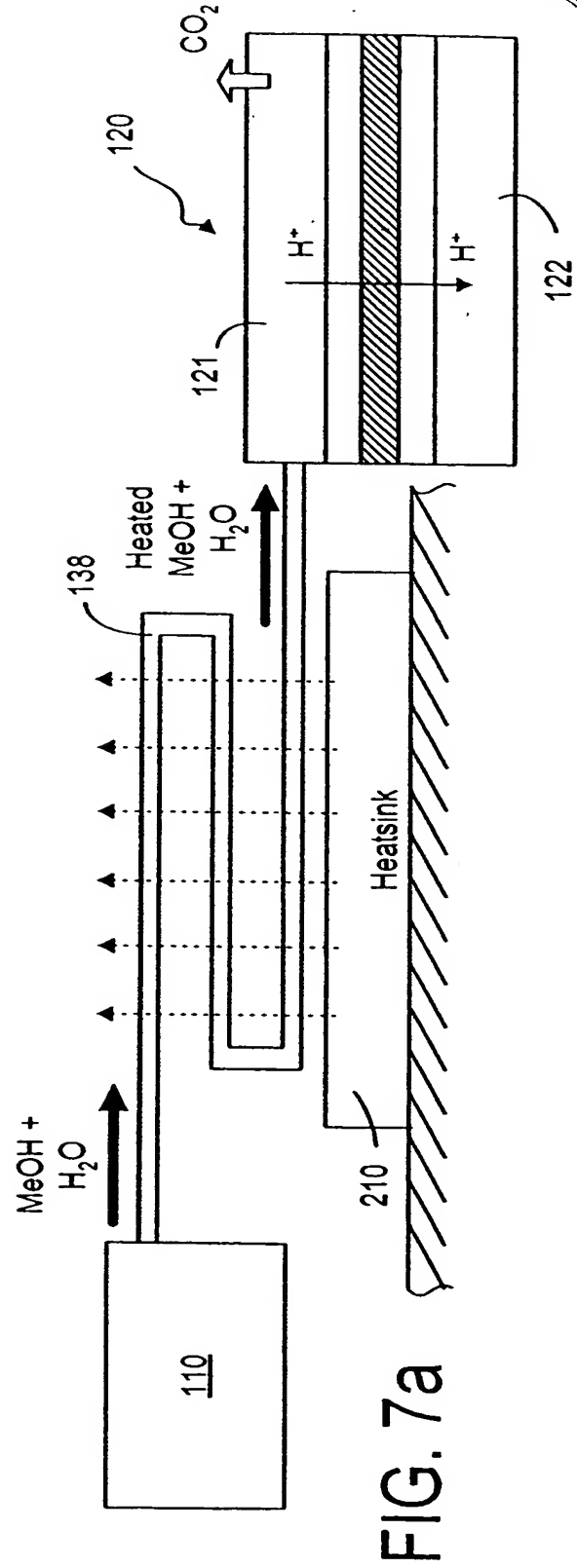


FIG. 7a

